

IN THE CLAIMS

In accordance with Rule 37 C.F.R. 1.121, please amend the claims in accordance with the following LISTING OF CLAIMS wherein the amended claims are indicated as "Original", "Currently amended", "Cancelled", "Withdrawn", "New", "Previously presented", or "Not entered" as the case may be. In accordance with the Rule, the text of cancelled or withdrawn claims is not presented. The text of all claims being currently amended is presented with markings to indicate the changes that have been made relative to the immediate prior version.

LISTING OF CLAIMS

c 1. (Currently amended) Seismic wave simulation apparatus for generating a simulated seismic wave in a geological specimen, said apparatus comprising an elastic energy accumulator including a member having a plurality of interconnected sections of different diameters and defining a first end directed towards said geological specimen and an opposite second end directed away from said geological specimen, means supporting said member so that said first end is adapted ~~arranged~~ to act on the geological test specimen and ~~supported to resist~~ movement of said member in a direction away from the specimen is resisted when said elastic energy accumulator member is preloaded in said direction away from the specimen by actuator means cooperative with said second end, the arrangement being such that the preload force is quelled suddenly by triggering an explosive means cooperative with second end of said member so that said member is released into impact or energy transfer with the geological specimen thereby transmitting a seismic wave to the geological specimen, ~~said apparatus being characterized in that the elastic energy accumulator member has a number of interconnected sections of different diameters.~~

2. (Currently amended) Apparatus as claimed in Claim 1 in which the elastic energy accumulator member has a number of ~~co-axial~~ coaxial cylindrical sections of different diameters of which a section at the end of the member remote from the actuator means constitutes an impactor adapted to be held adjacent a geological specimen under test so as to impact the specimen on release of the member.

3. (Previously presented) Apparatus as claimed in Claim 2 wherein said accumulator member has a section nearest the actuator means which is the smallest in diameter of the sections.

4. (Currently amended) Apparatus as claimed in Claim 3 ~~including wherein said~~ explosive means includes an explosive bolt disposed diametrically of said smallest diameter section.

5. (Previously presented) Apparatus as claimed in Claim 3 in which said smallest diameter section adjoins a larger diameter section which is connected to two further sections stepped down in diameter and connected in turn to a smaller diameter section which is larger in diameter than said smallest diameter section adjacent the actuator means.

6. (Previously presented) Apparatus as claimed in Claim 5 in which said smaller diameter section is connected to two larger diameter sections which are stepped up in diameter, the larger diameter section of these sections defining an impactor located adjacent the geological specimen under test.

7. (Currently amended) Apparatus as claimed in Claim 6 in which said ~~accumulator member~~ larger diameter section is supported to resist movement of said accumulator member in a direction away from a geological specimen under test by said ~~last-mentioned~~ larger diameter section.

8. (Currently amended) Apparatus as claimed in Claim 7 in which a blocking system or fixed support is ~~provided at the rear of said last-mentioned~~ cooperates with said larger diameter section and surrounds the smaller diameter section of said two larger diameter stepped sections so as to resist or prevent movement of the accumulator member in said direction away from said specimen on the application of the preload force.

9. (Previously presented) Apparatus as claimed in Claim 1 in which the elastic energy accumulator includes seven cylindrical sections of different diameters.

10. (Previously presented) Apparatus as claimed in Claim 1 in which the combined length of the elastic energy accumulator and the actuator means is of the order of 500 meters.

11. (Previously presented) Apparatus as claimed in Claim 1 having transducers arranged to measure a mechanical behavior across a section of a geological specimen through which a seismic wave is being transmitted.

12. (Previously presented) Apparatus as claimed in Claim 11 in which the smaller diameter section is connected to two larger sections which are stepped up in diameter, the last of these sections being adjacent to the geological specimen in use.

13. (Previously presented) Apparatus as claimed in Claim 1 including seismic sensors extending at an angle or transversely of the direction of propagation of the wave.

14. (Previously presented) Apparatus as claimed in Claim 1 including a thin metallic or conductive sheet fixed to a surface of the geological specimen and connected to measuring instrumentation in order to obtain superficial strain measurement.

15. (Currently amended) Apparatus as claimed in Claim 1 14 in which the measuring instrumentation includes accelerometers.

16. (Currently amended) A method of inducing or generating a simulated seismic wave in a test specimen, said method including the steps of;

providing an elastic energy accumulator comprising a member having a first end directed towards said geological specimen and an opposite second end directed away from said geological specimen, said member being arranged to act on the specimen so as to deliver a seismic wave to the specimen,

supporting the elastic energy accumulator member so as to resist movement in a direction away from the specimen,

preloading the elastic energy accumulator in said direction away from the specimen,

suddenly quelling the preload force by triggering an explosive means of the ~~elastic energy accumulator~~ at said second end of said member so as to release the elastic energy accumulator into impact or energy transfer with said specimen and transmit a simulated seismic wave to the specimen,

collecting data from the specimen and analyzing said data,

c' characterized in that wherein the energy accumulator member is shaped to define a number of interconnected sections of different diameters operative to deliver a seismic wave of known amplitude and duration.

17. (New) Seismic wave simulation apparatus for generating a simulated seismic wave in a geological specimen, said apparatus comprising an elastic energy accumulator including an elongated member having a plurality of generally coaxial interconnected substantially solid sections of different diameters and defining opposite first and second ends, means supporting said member so that said first end is adapted to act on said geological specimen and said second end is directed away from said geological specimen, actuator means cooperative with said member so as to enable said member to be preloaded in a direction away from said specimen, said support means being operative to resist movement of said first end in said direction away from the specimen when said member is preloaded by said actuator means, and explosive means selective cooperative with said second end of said member and adapted to be triggered so as to suddenly quell the preload force so that said member is released into impact energy transfer with the geological specimen and transmits a seismic wave to the geological specimen.
